

# InsideTech Transfer

A technology transfer newsletter published by the Department of Energy's National Energy Technology Laboratory

News Beat

## A DOE-Joint Industry Separation Technology Project Performed by The University of Tulsa Aids Petroleum Industry



A DOE-Joint Industry Partnership project performed by the University of Tulsa (TU)

will aid the petroleum industry when processing wellhead production of oil-water-gas flow. The TU Separation Technology Project (TUSTP) is advancing technology that will offer more efficient separation alternatives in the form of compact separators. The problem is that the production of oil is almost always accompanied by gas and water, making it necessary to separate the three-fluid phases so the amount of fluids can be accurately measured, and to separate the water from the hydrocarbons for cost-efficient transportation and refining.

### Problem:

Separation of produced oil, gas and water currently requires bulky, heavy, and expensive equipment; need simple compact, low weight and cost substitute; need better hydrodynamic flow behavior information; few systematic studies of design configurations for GLCCs; the number, pitch, diameter or orifices along separator tube can have a profound effect.

For the last several decades, the petroleum industry has relied on bulky, heavy, and expensive conventional vessel-type separators to address the problem, but economic and operational pressures forced the petroleum industry to seek less expensive more efficient separation alternatives in the form of compact separators. In response, the DOE-Joint Industry Partnership project performed by TU has resulted in the development of the Gas-Liquid Cylindrical Cyclone (GLCC), a simple, compact, low weight, low cost, separator that requires little maintenance and is easy to install and operate.

In support of the TU Separation Technology project, DOE invested \$683,000 over a five-year period. Industry contributions were projected at \$800,000 or 54% of the total project cost. Originally, there were 16 industrial members. The Oklahoma Center for the Advancement of Science and Technology (OCAST) joined the partnership in 1998 with a contribution of \$290,000. In addition, there were equipment donations from ARCO's Plano Flow and Separation Laboratory, Halliburton-Dresser Houston Multiphase Flow Loop, and Phase Dynamics Water-Cut Meters.

### DOE-JIP

Members	BP/Amoco	OCAST
	Chevron	Pemex
	Conoco	Petrobras
	Ecopetrol	Premier
	Elf	Schlumberger
	Intevep (PDVSA)	Texaco
	Jiskoot	Unocal
	Micro-motion	Westinghouse
	MPE	

In phase one of the project (October 1997-September 2000), TU developed a two-phase GLCC. The result was more than 100 GLCC units used in the field. In the second phase of the project (October 2000-September 2002), TU and Texas A&M will validate the GLCC design for three-phase flow. A simulator has tested flow results for two- and three-phase flow. Weight savings are 4:1 and space savings 10:1.

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Laboratory model of GLCC with control systems at The University of Tulsa, Tulsa, OK.

One Gulf of Mexico offshore non-producing well was brought back to 1,000 bbl/d production equaling \$821,250 in royalties to the Minerals Management Service (based on an average 15% offshore royalty rate and \$15/bbl oil on an annualized basis), plus an estimated 17% federal tax on production in the amount of \$791,138.

Early in 1998, there were 36 six-inch compact separators in the field that can be tied to the research funded by the consortia. Today, there are 350 units operating in the field. Chevron has built two prototype GLCC separators in California and

15 in Oklahoma, and has designed units for use in Canada and the Gulf of Mexico. In Chevron's configuration, gas and liquid streams are separated in a simple GLCC, metered by gas and liquid flow meters and recombined for transport. The cost for construction and installation for a field prototype GLCC is approximately \$2,500.

Petrobras in Brazil is retrofitting a separator because the production mix contains too much water to function well. The compact separator will be placed upstream of the primary separator and will bring it back into usefulness. Intevep in Venezuela is using the compact separator on platforms in Lake Maracaibo in a multiphase flow loop configuration. Company officials predict savings of tens of thousands of dollars in reduced equipment needs. Other sites in the planning or completion stages were sched-

uled in 1998 in Nigeria, Indonesia, Kuwait, and the Gulf of Mexico.

Though slightly different in design from the GLCC, ARCO has field-tested a downhole gas-liquid centrifugal separator in Alaska. This auger-type separator is being used to provide gas lift from a high gas-oil-ratio well at Prudhoe Bay field. The simulator has been used to design over 200 two-phase GLCC units operating in the United States and around the world. Consortia members are currently commercializing these separators. Members are encouraged by their performance and are considering putting the three-phase separator in the field. The three-phase system will be small and economical as well, but is applicable for bulk separations and cannot be used for fine separation of the phases.

Impacts of the project are significant and include cost savings derived from the weight and space savings of the Cyclone separators. Capital costs are 10-20% below a conventional plant. These requirements are more severe in offshore operations where platform costs are escalating. The use of the Cyclone separator vs. a conventional separator results in at least a three-fold cost saving. For offshore operations, a conventional separator would cost \$180,000 compared to \$60,000 for a Cyclone separator. Added savings are achieved because of reduced maintenance and operational costs.



Several companies are using the GLCC for some applications, and others are exploring new applications. The GLCC is commercially available through some vendors, and some are in the process of incorporating the GLCC into their compact-separator product line. There is evidence that the use of the GLCC in new and existing applications is ongoing. In turn, this creates new markets and new jobs. Through the use of the GLCC, production rates are increased which in turn extends the life of a reservoir.

The biggest industry impact of the GLCC technology may be in subsea separation applications. Undoubtedly, development of marginal offshore fields will depend on the development of efficient and economical technologies. Subsea applications require a high degree of confidence in separator design and performance while demanding that the equipment be simple, compact, robust, and economical. The GLCC should be able to compete with other technologies.

With emphasis on keeping marginal offshore wells productive, the GLCC—as a key component of the processing system—should offer solutions that result in more economical production of reserves from these wells. Also, with design modifications, the GLCC could be used as a pollutant separator for reducing environmental risks. For example, it has the potential to separate solids from drilling muds prior to their discharge. The GLCC could also be



used for removal of precipitated chlorides and fluorides from water, which could later be used for drinking purposes.

Another advantage of the GLCC is its smaller residence time and compact dimensions which reduces the inventory of hydrocarbons in each GLCC system. This is crucial from an environmental point of view, but also for safety considerations. Storage of lower inventory of hydrocarbons by GLCC is less hazardous in the event of fire or explosion, especially in offshore platforms where high flow rates and high pressures are very critical.

For downhole oil/water separation technologies, eighteen installations have been completed in Western Canada, and U.S. field tests have demonstrated the concept of downhole separation with water production to surface reduced from between 85-97%. This will reduce

environmental risks associated with water production and disposal, and because of their size, the GLCC will reduce the environmental footprint in sensitive areas.

Additional research by Baker Hughes will use the technology in its “Downhole Factory”—a production management system that combines fiber optics, robotics, artificial intelligence, and other technology to refine oil or convert natural gas into electric power within the wellbore. According to Baker, the elimination of water downhole means a smaller surface platform with less treatment facilities and less weight. If half the water can be eliminated downhole and half at the sea floor, then there is no need for a platform for separation equipment.

Expanding the goals of the TU Separation Technology Project could result in other applications for the technology. To date, Chevron has

# News Beat cont'd.

begun independent research on horizontal separators. The simulator developed as part of this project has been used in more than 100 GLCC units operating in the United States and around the world. Companies using the technology resulting from this project include ARCO, CPI, Chevron, Conoco, Daniels, Ecopetrol, Elf Exploration, Jiskoot, Krebbs Petroleum, Modular Production Equipment, PDVSA, PEMEX, Petrobras, Premier Instruments, Schlumberger, Texaco, Unocal, and Westinghouse.

*"Most important, is the contribution the technology makes in improving our Nation's energy security."*

Not only has the TU Separation Technology Project proven successful, there is evidence to show that continued research is needed to develop and improve the GLCC separator so that it is smaller, lighter, and less costly to operate. Advancing the technology from two-phase to three-phase will, ultimately, impact industry through cost savings, more efficient operations, increased production and reservoir life extension, and enhanced environmental impacts. Most importantly, is the contribution the technology makes in improving our Nation's energy security.

TU is considered a pioneer and leader in compact separator research. Only one other place in Europe is conducting research on separators—Christian Michelsen Research AS (CMR) is a research institution owned and run by Christian Michelsen Institute (CMI) and the University of Bergen. It is supported by Norsk Hydro AS Research Centre, Porsgrunn, Statoil, Elf Petroleum, Norway, British Petroleum, Norway, Rogaland University Centre (HSR), Stavanger, University of Manchester, Institute of Science and Technology (UMIST), UK, SINTEF/SI, Dept. of Microelectronics, Oslo.

The end users of this technology are the oil and gas companies in their production operations, flow monitoring equipment manufacturers, and companies that need to accurately determine the amount of oil-water-gas in multiphase mixtures for transport. Potential applications include flow meters and pumps, portable well testing, steam quality metering, flare gas scrubbing and surface or subsurface separation. This flexibility combined with successful field applications demonstrate the pronounced impact this technology could have on the petroleum industry.

For more information about the DOE-Joint Industry Separation Project Performed by the University of Tulsa contact Rhonda Lindsey, National Energy Technology

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## Summary of Successes

### Economic Benefits

- field application demonstrated a savings of \$3.2 million over conventional separators;
- offshore use of gas separated by a GLCC brought a non-producing well back to life at 1000bbl/d with \$821,250 royalty to MMS and \$791,138 in federal taxes;

### Environmental Benefits

- field prototype – cost of conventional separator; smaller footprint reduces environmental damage and gives weight saving of 4:1 and space savings of 10:1;

### Commercialization

- a simulator has tested 2-phase and 3-phase low pressure flow and high pressure test by year end; over 350 GLCC units in the field.

Visit the TUSTP website at [www.tustp.org](http://www.tustp.org) for information about the DOE-JIP Separation Technology Project at The University of Tulsa.

## DOE's Near-Term R&D Effort: Field Oriented Research Projects for Independents

During the winter of 2001-2002 the U. S. Department of Energy's (DOE) National Energy Technology Laboratory (NETL) in co-operation with the Petroleum Technology Transfer Council (PTTC) conducted a series of one-day informational workshops entitled "Field-Oriented Research Projects for Independents". The workshop series focused on DOE's field-oriented research program, which targets the needs of U.S. independent oil and gas producers. The purpose of the workshop series was to 1) inform attending independent producers about future opportunities to work with DOE through various DOE R&D programs, and 2) transfer recent technology research results from a number of DOE-funded, near-term field demonstration projects to other independent oil and gas producers.

Independent producers now operate the majority of wells in the domestic U.S., and many of those wells are mature or marginal producers. In the Lower-48, independent operators drill 85% of all new wells, account for 50% of all oil production, and account for 66% of all natural gas production. Clearly, the independent segment of the oil and gas industry contributes significantly to the recovery of vital domestic oil and gas resources. Many independent operators typically do not have the

resources to conduct in-depth research and development, do not have access to commercial research services, or are unfamiliar with the latest technologies with which to improve their production operations. In support of their efforts, DOE, through NETL's Strategic Center for Natural Gas (SCNG) and its National Petroleum Technology Office (NPTO), provides funding assistance for several field-oriented research programs which encourage independent producers to try unfamiliar technologies or novel, unproven approaches to help solve their particular production problems. Technologies demonstrated through these projects can be utilized elsewhere to positively improve production and profitability quickly. Consequentially, independents can benefit by learning about new technologies, or new twists with old technologies, that have been demonstrated by others as technically and economically feasible. DOE promotes these programs and pursues the effective transfer of the technology developed to the oil and gas industry through efforts such as this series of PTTC workshop forums.

Three major field-oriented DOE programs for independents are:

- *Stripper Gas and Oil Well Program*—Aimed at developing and demonstrating new

technologies which are applicable to "stripper" oil and gas wells and which will result in increasing production, reducing operating costs, and/or reducing the environmental footprint. Information about this program is available on the NETL website at [www.netl.doe.gov/scng](http://www.netl.doe.gov/scng).

- *Technology Development with Independents Program*—Provides DOE funding for field demonstration of technologies across a broad range of exploration and production technology areas aimed at sustaining current production levels and slowing the premature abandonment of marginal wells. Independent producers can participate in this program by submitting proposals through the NETL website at [www.netl.doe.gov](http://www.netl.doe.gov). Information about this program is also available on the NPTO website at [www.npto.doe.gov](http://www.npto.doe.gov).

- *Stripper Well Consortium*—Funds short-term (one-year) projects proposed by consortium members and selected by an industry governing council consisting of consortium members. Independent producers should consider joining the consortium to participate in future projects funded by DOE. Information about the consortium may be obtained by accessing the Penn State web site at [www.energy.psu.edu/swc](http://www.energy.psu.edu/swc).



Other DOE programs discussed at the workshops included the Advanced Drilling, Completion, and Stimulation Program (ADCS); the Preferred Upstream Management Practices Program (PUMP); Phase 4 of the Technology Development with Independents program (an extension of the existing program); and a new program for independents for larger, higher risk projects which is expected to be announced on the NETL website by April, 2002.

Six projects from the Stripper Gas Well Program and the Technology Development with Independents Program were selected for each workshop to address issues similar to regional production operations. Specific project technologies included on-site electrical generation using non-salable lease gas, a marginal expense oil well wireless surveillance system, reservoir characterization using detailed core-log correlations, evaluating waterflood success using artificial intelligence, reservoir modeling using artificial intelligence, reservoir characterization and modeling of a geologically complex reservoir, a customized acid stimulation treatment, application of multi-component vertical seismic profile (9-C VSP) seismic technology, signed-bit 3-D seismic data processing and interpretation, computer software to monitor stripper gas well production performance, computer software to identify underperforming stripper gas wells, selection and treatment of stripper gas wells for production stimula-

tion, and stripper gas well water remediation. Overall, the technology advances and project results of thirteen different projects were presented during the series of eight workshops.

Each speaker presentation was followed by open and interactive question-and-answer, discussion-and-comment sessions in which participants and attendees shared their experiences and comments regarding the projects, programs, and related issues. All together, one hundred and forty six (146) individuals from industry (not including the speakers, DOE, PTTC, state, federal, or academic attendees) participated in the series of eight DOE/PTTC workshops. Attendees included a wide range of interested parties such as independent producers and operators, engineers, geologists, consultants, investors, land managers, service company representatives, educational and academic personnel, state and federal government regulatory agency personnel, producers association representatives, technical journal editors, and others. The workshops provided an excellent and unique opportunity for the DOE program and project managers from NPTO and SCNG who manage the DOE programs and projects to meet with some of the independent oil and gas industry personnel with whom DOE is targeting to do business with. The increased level of visibility afforded by the DOE presence will help promote the idea that they all share and support the common goals and

objectives of efficiently producing vital oil and gas resources in as economically and environmentally balanced a manner as possible.

Insights from several of the projects presented during the workshop series will be summarized in an upcoming PTTC national newsletter and on the PTTC website at [www.pttc.org](http://www.pttc.org). Additional articles have been included in DOE's *Class Act Newsletter* (Winter 2002) and a state-of-the-art summary article by Karl R. Lang (with Hart/IRI Fuels Information Services and editor of GasTIPS) in the *PTTC Network News* (4th Quarter 2001).

For more information about the DOE/PTTC Traveling Workshop Series, contact Lance Cole at 918-241-5801 or e-mail: [lc@pttc.org](mailto:lc@pttc.org).

Additional information regarding the *Stripper Gas and Oil Well Program* and the *Stripper Well Consortium* may be obtained by contacting Gary Covatch at 304-285-4589 or e-mail: [Gary.Covatch@netl.doe.gov](mailto:Gary.Covatch@netl.doe.gov).

Additional information regarding the *Technology Development with Independents Program* and the new program for larger, higher risk project opportunities for independents may be obtained by contacting Jim Barnes at 918-699-2076 or e-mail: [Jim.Barnes@npto.doe.gov](mailto:Jim.Barnes@npto.doe.gov).

## Two New Projects Awarded to Small Independent Operators-Phase 3 (Round 2)

As part of DOE's Fossil Energy research program, *Technology Development with Independents*, the following grants were announced February 2002.

**Woolsey Petroleum Corporation**, Wichita, KS, to study ways to improve "hydraulic fracturing," a technique in which water is injected into an oil-bearing formation to open fractures in the underground rock and free oil that might otherwise not be produced.

### Optimizing Fracture Treatment in a Mississippian "Chat" Reservoir, South-Central Kansas

This 12-month project will investigate geologic and engineering factors critical for designing hydraulic fracture treatments. The target reservoirs for this project – the Mississippian reservoirs of Kansas – account for over 1 billion barrels of oil produced to date in Kansas and roughly 40% of the state's current annual production.

Although geographically widespread, the oil-bearing formation varies widely in geologic features. Optimum hydraulic fracturing design is poorly defined in the formations with poor correlation of treatment size to production increase.

Woolsey Petroleum Corporation will extract sample rock cores

from a well drilled between existing wells – called an "infill" well – and run modern wireline logs to determine the location and extent of oil remaining in the formation that remains unrecovered by prior operations.

Using the data, the company will design a way to hydraulically fracture the reservoir to free the additional oil.

Partners include the Kansas Geological Survey and an independent geological consultant.

Point of Contact: I. Wayne Woolsey  
(316) 267-4379

**TENECO Energy LLC**, Wheat Ridge, CO, to help restore production in East Texas oil fields by using advanced computer imaging technology, new logging tools to locate promising geologic features, and high capacity pumps.

### Using 3D Computer Modeling, Borehole Geophysics, and High capacity Pumps to Restore Production to Marginal Wells in the East Texas Field

The East Texas oilfield, in the east central part of the state, is the largest and most prolific oil reservoir in the contiguous United States. Since its discovery on October 5, 1930, some 30,340 wells have been drilled within its

140,000 acres to yield over 5.2 billion barrels of oil.

The goal of this project is to extend the life of marginal wells in the East Texas Field using advanced computer imaging technology, geophysical tools and high capacity pumps. TENECO will collect data on key geologic features from at least four wells using modern slimhole Array Induction/Neutron Density logs. This information will then be correlated with features from old well logs to determine the sections of the formation that could still contain unproduced oil.

Three dimensional geological images will be constructed with historical data from several hundred surrounding leases. A demonstration well will be drilled to validate the results of this project.

Successful demonstration of this combined technology will assist operators in evaluating and producing petroleum resources in mature reservoirs throughout the region.

Partners include Industrial Gas Services, and Schlumberger Wireline and Testing.

Point of Contact: R.L. Bassett  
(303) 423-8187

# New Business

## New Business Opportunity: *Technology Development with Independents*

The DOE National Energy Technology Laboratory on behalf of the National Petroleum Technology Laboratory is seeking applications for a Financial Assistance Program Solicitation entitled, *Technology Development with Independents* to provide solutions for oil production problems. The objectives of the solicitation are to receive applications for research and development, advocating solutions for production problems experienced by small U.S. independent oil producing operators.

Proposed efforts must incorporate innovative field technologies for use by small U.S. independent oil producing operators to increase production, reduce operating costs, increase environmental compliance, or combinations thereof. The types of technologies to be considered are not limited to reservoir characterization, well drilling, completion or stimulation, environmental compliance, artificial lift, well remediation, secondary or tertiary oil recovery, and production management.

This solicitation is restricted to small, independent oil producing operators. Small independent, oil-producing operators are defined as (1) companies employing less than 50 full-time employees; and (2) having no affiliation with a major oil or gas producer (domestic or foreign) unless the combined number of employees of all affiliates is less than the 50 full-time employees and total annual gross revenues of all affiliates is less than \$100 million.

It is anticipated that there will be approximately 12 to 15 awards throughout the year, ranging from \$50,000 to \$75,000 (DOE share) resulting from this solicitation. Industry cost share of 50% per project is required, up to a limit matching the \$75,000 funding currently provided by DOE.

All proposal submissions must be made in accordance with the Industry Interactive Procurement System (IIPS), accessible through the NETL website. Further, this solicitation has been amended to provide for a pre-application submission procedure which may be submitted for project review prior to submitting a comprehensive application. The solicitation has three evaluation periods with separate application deadlines for both the pre-application and the comprehensive application:

- Evaluation Period 1:  
Pre-application due **29 Apr 2002**  
Comprehensive application due **13 June 2002**
- Evaluation Period 2:  
Pre-application due **12 Aug 2002**  
Comprehensive application due **26 September 2002**
- Evaluation Period 3:  
Pre-application due **25 Nov 2002**  
Comprehensive application due **09 January 2003**

For more information about the solicitation, visit the NETL Electronic Business Center at <http://www.netl.doe.gov/business/index.html>

For more information about the Industry Interactive Procurement System, go to <http://www.e-center.doe.gov>

### *Inside* Tech Transfer

The *Inside Tech Transfer* newsletter covers outreach activities of the Department of Energy's National Energy Technology Laboratory's Petroleum Technology program

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## Technology Development with Independents Program—Overview

The *Technology Development with Independents Program* provides matching grants of up to \$75,000 to companies willing to apply innovative approaches that can lower operating costs and extend the life of marginally producing fields.

**Awards:** Up to \$75K  
**Recipients:** Small Independent Producers  
**Focus:** Lower operating costs, extend the life of fields

The program reflects the growing importance of small oil producers in supplying America's demand for oil. The domestic oil industry has

changed significantly over the last 15 years, with larger oil companies moving to more lucrative prospects overseas, leaving behind smaller companies to continue producing aging and often declining U.S. oil fields. Independent producers now account for 40% of the oil produced in the United States and nearly 60% of the oil produced from onshore fields in the lower 48 states.

Since 1995, the *Technology Development with Independents Program* has provided small businesses in 13 states, each with less than 50 employees, the financial backing to test new techniques that might otherwise have remain untried. The program is one of several initiatives in the Energy

Department's fossil energy program that is working to slow or halt the decline in U.S. oil production.

The types of technologies considered included:

- reservoir characterization
- well drilling, completion or stimulation
- environmental compliance
- artificial lift
- well remediation
- secondary or tertiary oil recovery
- production management

Companies that achieve success in prolonging the productive life of their fields then convey the techniques to other small producers facing similar difficulties.



**To obtain a copy of the following brochure "Technology Development With Independents, Goal: Keep Wells Productive", contact Bernadette Ward at 918-699-2033 or [Bernadette.Ward@npto.doe.gov](mailto:Bernadette.Ward@npto.doe.gov)**

**For more information about the *Technology Development with Independents* program, go to the NPTO website at [www.npto.doe.gov](http://www.npto.doe.gov)**

## DOE's New Electronic Application Process: Industry Interactive Procurement System (IIPS)

DOE's new electronic application process, Industry Interactive Procurement System (IIPS) is required to submit proposals for solicitations. IIPS is DOE's electronic system for issuing solicitations and receiving proposals. The IIPS system is mandatory for all DOE offices, and for those who wish to submit a proposal in response to a DOE solicitation.

The main function of IIPS is to allow users to access synopses, solicitations, and related documents. Users must register before access to the system is allowed.

### How to Register

Follow these steps: (1) Go to DOE's E-Center at <http://www.e-center.doe.gov>; (2) click the register button; (3) Check the box for acquisitions greater than simplified acquisition threshold; (4) check register only; (5) proceed to form; (6) fill in the required blocks, and click submit. An e-mail will confirm your registration.

### Login Process

After you receive confirmation of your registration you can login to the E-center home page at <http://www.e-center.doe.gov>; click on the Industry Interactive Procurement System radio button; when the dialog box appears, enter your user name & password and click "OK"; the "View Opportunities By" page appears. Click on contracting activity; select National Energy Technology Laboratory; then go to specific master solicitation.

### Creating A Proposal

Prepare application volumes as required in the Master Solicitation;

login at <http://www.e-center.doe.gov>; navigate to the solicitation and click on the solicitation document; click the "Create Proposal" button on the top of the screen; complete the required fields on the screen; and click on the "Submit Cover Page & Attach Files" button. Next, click on the appropriate volume; click the "Browse" button(s) and attach the required files; click on the "submit" button; an acknowledgement is received; follow the appropriate link on the Acknowledgement page—attach more files, or verify submission. For help contact: 1-800-683-0751 or email the help desk personnel at [IIPS\\_helpdesk@e-center.doe.gov](mailto:IIPS_helpdesk@e-center.doe.gov).

## Look for this new program solicitation in April 2002

**Advanced Technology Development by Independents for High-Risk Domains**  
DE-PS26-02NT15376

The DOE National Energy Technology Laboratory, on behalf of the National Petroleum Technology Office, anticipates the release of a new solicitation. The purpose of this solicitation is the final development and demonstration of advanced technology especially relevant to the operations of the domestic independent producers in high-risk domains such as the shallow offshore Gulf of Mexico, Alaska, and Rocky Mountain Frontier.

## Solicitation Announcements

**Identification & Demonstration of Preferred Upstream Management Practices (PUMP III) for the Oil Industry**  
DE-PS26-02NT15378

The DOE National Energy Technology Laboratory, on behalf of the National Petroleum Technology Office, seeks cost-shared research, development, and demonstration applications of preferred management practices addressing information-related barriers to production in a region and the documentation of these practices for use by the oil industry.

**Focused Research in Air Quality and Produced Water Management in Oil and Gas Exploration and Production**  
DE-PS26-02NT15373

The DOE National Energy Technology Laboratory, on behalf of the National Petroleum Technology Office, is soliciting applications for cost-shared research projects that address specific air quality or produced water management issues faced by the oil and gas industry. The goal is to provide solutions to issues that are limiting domestic onshore or offshore production while providing the same or higher levels of environmental protection.

# Who's Who

## NETL Names New Management Staff



**Dan Gurney, Product Manager for Petroleum Environmental Solutions**, National Energy Technology Laboratory (NETL). An Industrial Engineer with a Master's degree from the University of Oklahoma, Gurney has been associated with the National Petroleum Technology program and its predecessor organizations for 23 years. In 1978, Dan joined the Bartlesville Energy Technology Center (BETC) as a project leader. From 1983-1998 BETC was reorganized into the National Institute for Petroleum and Energy Research (NIPER) where Dan was a senior engineer/scientist, principal investigator and section manager working on the effects of combustion and evaporative emissions of fuels and the affect on air quality. His work with EPA led to improved air quality models. Dan was an early advocate of considering the importance of the oxides of sulfur and the oxides of nitrogen on air quality. Dan continued his career at National Energy Technology Laboratory in Tulsa as a project Manager. He belongs to the Society of Automotive Engineers, the American Society of Mechanical Engineers, the Air and Waste Management Association, and the Combustion Institute.

**Roy Long, Product Manager for Petroleum Exploration and Production**, National Energy Technology Laboratory. He is a graduate of the U.S. Air Force Academy and received his M.S. in Petroleum Engineering from the Colorado School of Mines. Following distinguished service as an aircraft commander in Air Force heavy jet transports, he worked in the petroleum industry from 1978 to 1988 as an engineer for Tenneco, Petro Lewis, and then as an international drilling consultant. From 1988 to 1996 he worked at DOE's Yucca Mountain Project Office (YMP) where he was appointed Principal Investigator for their Dry Drilling and Coring Technology Development Program. He transferred to the National Energy Technology Laboratory in Morgantown, West Virginia in 1996 where he served as Project Manager and lead for the Drilling, Completion, and Stimulation Technologies focus area in NETL's Strategic Center for Natural Gas. Roy's current work involves industry outreach and program planning for NETL's Upstream Technology Program.



**Venkat Venkataraman, Product Manager for Petroleum Fuels**, National Energy Technology Laboratory. Dr.Venkataraman's educational qualifications include a Ph.D. in Chemical Engineering from the State University of New York at Buffalo and advanced business and management-related courses at the Harvard Business School and the Wharton School of University of Pennsylvania. This is supplemented by over 10 years of industrial experience, including stints at Air Products & Chemicals, Inc., and Dow Corning Corporation in the area of advanced separations with specialization in membrane science and technology. Since joining NETL in 1990, Dr.Venkataraman has had project management responsibility in several programs including advanced power systems, environmental waste management and natural gas processing and utilization. In 1997, he became the Product Manager for all of NETL's activities in the Natural Gas Processing and Utilization arena. His professional memberships include AIChE, North American Membrane Society and Sigma Xi.



U.S. Department of Energy  
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*Inside* Tech Transfer

Spring 2002

# Resources

If you are interested in meeting NETL's technical staff or want to find out more about our programs you can do so at any of the following meetings or go to the NPTO website at [www.npto.doe.gov](http://www.npto.doe.gov):

## *May*

**SPE**, Offshore Technology Conference, May 6-9,  
2002, Reliant Center at Reliant Park, Houston, TX.  
NPTO Booth No. 4448.  
Contact: Bernadette Ward, 918/699-2033  
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**AAPG/SPE**, Pacific Regional Conference, May 18-  
23, 2002, Sheraton Anchorage Hotel, Anchorage,  
AK. NPTO Booth No. 10.  
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## Sites To See...

Technology Development with Independents, [www.npto.doe.gov/indep/index.html](http://www.npto.doe.gov/indep/index.html)  
Petroleum Technology Transfer Council, [www.pttc.org](http://www.pttc.org)  
Industry Interactive Procurement System, [www.e-center.doe.gov](http://www.e-center.doe.gov)